

We claim:

1. An Internet Protocol (IP) services switch that supports packetized voice traffic in the form of voice packets from a plurality of enterprises, wherein each enterprise has a plurality of endpoints and more than one enterprise uses the same IP addresses, the IP services switch comprising:

a plurality of Network Address Translation (NAT) tables, each of said NAT tables corresponding to a separate enterprise for providing header IP addresses and payload IP addresses which are unique to the services switch for voice packets corresponding to each separate enterprise endpoint.

2. The Internet Protocol (IP) services switch defined in claim 1 wherein the unique header and payload IP addresses come from a static pool of IP addresses.

3. The Internet Protocol (IP) services switch defined in claim 1 wherein the unique header and payload IP addresses come from a dynamic pool of IP addresses.

4. The IP services switch defined in claim 1 wherein the unique header and payload IP addresses are private to the service provider.

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5. The IP services switch defined in claim 1 wherein the unique header and payload IP addresses are public addresses.

6. The IP services switch defined in claim 1 wherein the unique header and payload IP addresses are source addresses.

7. A Voice Over Internet Protocol (VoIP) application-aware Internet Protocol (IP) services switch for providing Network Address Translation (NAT) for VoIP packets moving between enterprise private networks and a service provider intermediate network, wherein the enterprise private networks include a plurality of endpoints having private IP addresses which are not unique to the service provider intermediate network, the IP services switch comprising:

a first NAT table stored in a first memory space for providing NAT for VoIP packets having header and payload IP addresses corresponding to a first enterprise private network; and

a second NAT table stored in a second memory space for providing NAT for VoIP packets having header and payload IP addresses corresponding to a second enterprise private network.

8. The VoIP application-aware IP services switch defined in claim 7 wherein the first and second NAT tables translate the private enterprise network header

and payload addresses to header and payload addresses which are unique to the service provider intermediate network.

9. The VoIP application-aware IP services switch defined in claim 8 wherein the unique header and payload IP addresses are private IP addresses to the service provider intermediate network.

10. The VoIP application-aware IP services switch defined in claim 8 wherein the unique header and payload IP addresses are public IP addresses.

11. The VoIP application-aware IP services switch defined in claim 7 wherein the first and second NAT tables translate header and payload IP addresses which are unique to the service provider intermediate network to the private enterprise network header and payload IP addresses.

12. The VoIP application-aware IP services switch defined in claim 11 wherein the unique header and payload IP addresses are private IP addresses to the service provider intermediate network.

13. The VoIP application-aware IP services switch defined in claim 11 wherein the unique header and payload IP addresses are public IP addresses.

14. A method of Network Address Translation (NAT) in an intermediate service provider network for Internet Protocol (IP) voice traffic packets corresponding to a plurality of private enterprise networks, wherein the private enterprise networks include a plurality of endpoints having private IP addresses and more than one of the private networks use at least some of the same non-unique private IP addresses, the method comprising:

providing an IP services switch having first and second NAT tables;

receiving VoIP packets from a first private enterprise network having headers and payloads with non-unique private IP addresses;

translating the private header and payload IP addresses to IP addresses which are unique to the intermediate network using the first NAT table;

receiving VoIP packets from a second private enterprise network having headers and payloads with non-unique private IP address; and

translating the private header and payload IP addresses to IP addresses which are unique to the intermediate network using the second NAT table.

15. The method of NAT defined in claim 14 wherein the unique header and payload IP addresses are private to the service provider intermediate network.

16. The method of NAT defined in claim 14 wherein the unique header and payload IP addresses are public addresses.

17. The method of NAT defined in claim 14 wherein the unique header and payload IP addresses are source addresses.

18. The method of NAT defined in claim 14 wherein the unique header and payload IP addresses are destination addresses.